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## AUTOMATISM AND SPONTANEITY.

IN the mediæval world man's longing for close communion with the powers that underlie creation was readily satisfied. His terrestrial dwelling-place with its starlit vault he believed to be the universe ; and himself, as immortal soul, the supreme concern of God and the Devil, of all the hosts of heaven and all the imps of hell.

What humiliating shock to this fondly nurtured self-importance, when—at last convinced by science—modern man found himself standing amid infinity on the thin crust of an inferior orb, whirling at a tremendous speed round and round one of the myriad suns that people unlimited space.

Worse still, he had to learn that all the wondrous happenings of nature, hitherto attributed to the volitional fiat of creating agents, and held to be taking place solely for his own sake, were in reality the rigorously necessitated outcome of mechanical laws that had been in operation since the beginning of things.

Under such mechanical dispensation, extending into abysmal space and over ages upon ages of time, what then was he, diminutive earthling, with his little span of life?

As corporeal being the constituent particles of his organism were thus fated to obey the same undeviating laws that govern the figurations and motions of inorganic bodies. And this necessarily implies, that all vital activities, so-called voluntary movements included, result—beyond his volitional control—from the strictly determined play of mechanical impact.

As a percipient being he was merely passively mirroring what

in reality was occurring outside of him on this planet or in the boundless universe. Mind and body, he was but a tuneful instrument constructed and played upon by external powers.

And though Leibnitz, whose teachings gained the ascendancy in some quarters, conceived the percipient soul as an entelechy or self-acting entity, yet as such it was likewise only reproducing within itself in a representative way either innate ideas, or the orderly events of an independent outside world.

Despite a life of growing experience, filled with thrilling emotions, self-determined volitions, and vaunted deeds, we were shown in the light of science to be only so many conscious automata, only marvellously intricate appendages to nature's all-comprehending mechanism.

It is true, under the sway of the mechanical philosophy, and mainly in reaction against its materialistic tendencies, our sensations were proved to be the veritable elements out of which the world we perceive is actually formed. And it is now commonplace of philosophy, that what we call the sweetness of a thing is only the quality of sweetness belonging to our own sensation; and what we call the thing itself only a compound of our own visual and tactile impressions.

Berkeley, as we all know, on the strength of such reasoning, and to the inexhaustible merriment of his contemporaries, denied altogether the existence of an outside material universe. For if the world we actually perceive is out and out composed of mental elements, what need of another second world materially subsisting beyond such perception? Consequently, according to this view, percepts are the only constituents of the world, and its so-called objects are mental phenomena and nothing else.

Yet, even then, these percepts of ours, constituting a world of purely ideal consistency, were not believed to be products of our own making, but only flashed upon our mind by a corresponding volitional fiat of the Deity. Man, consisting thus simply of a percipient mind, soul, or spirit, was here again only passively and representatively mirroring that which was being fashioned and actuated outside and independently of himself.

In the light of Berkeley's idealistic interpretation, man has to be conceived as a mere receptive *tabula rasa* ; as a kind of potential camera obscura ; in fact, as an invisible perceiver, whose visible embodiment is being continually composed of divinely emanated ideas, and who is disporting himself in a perceptual world composed of the same immaterial stuff.

It has been asserted by eminent authorities that Berkeley's reasoning is flawless. But is it not a sufficient *reductio ad absurdum* when such reasoning necessarily leads to the conclusion, that our persistent seeming body consists in reality of divine ideas flashed in fitful gleams upon our percipient mind, and belonging therewith no more intimately to ourselves, than to any other being who may likewise happen to perceive it?

This wildly speculative conception would seem to unsophisticated minds all too fantastic to be seriously entertained. But as thoroughgoing Idealists do not shrink from accepting even this extravagant outcome of their theory, the exact flaw in Berkeley's, as indeed in all purely idealistic reasoning, shall be definitely pointed out in the course of this discussion.

The sensation-philosophy, this psychological counterpart of the mechanical theory, with its pseudo-mechanical grouping of sensorial elements, consistently and unflinchingly expounded by Hume, stranded him inextricably, and to the great scandal of an illogical world, amid a matterless, soulless, godless, meaningless phantasmagoria of nothing but actual and remembered sensations.

No wonder that, under such complete ratiocinative volatilisation of our inner and outer being, and of everything besides, fervent souls were more than ever driven to seek communion with the perpetual powers through the ancient channels of direct emotional blending or of intuitive apperception.

Science, however, overrules mere emotional or intuitive yearning. With its logically consistent interpretation of carefully verified facts it carries intellectual conviction to all willing and capable of following the light of reason in its application to natural phenomena. Stimulated by the marvellous progress made in the interpretation of such phenomena under the sway of the mechanical theory, science

has been persistently striving to extend its mechanical dominion over all natural occurrences whatever.

The truth, that is, the full objective validity, of the mechanical theory once admitted, sound logical reasoning feels irresistibly compelled to look upon the course of nature in its entirety and in its minutest particulars as inexorably foreordained. Such course is then unalterably resulting from the primordial cast, from the initial positions and velocities of the elements that are obeying the mechanical laws. Or, otherwise expressed, all formations and activities in nature are then, and have ever been, the product of a definite amount of indestructible mechanical energy at work among the definite number of inert and indestructible elements that compose the substance of the things of this world, our own body among the rest.

All consciousness, all our sensations, thoughts, emotions, and volitions have, consequently, to be considered as a mere ineffective by-play to this purely mechanical actuation.

In vain do our philosophers seek to avoid this unavoidable conclusion. If the mechanical theory is—as generally *scientifically* believed—a correct interpretation of the actual state of things, then, inevitably, we ourselves are but conscious automata, with no power whatever to influence the course of nature, our own movements not excepted.\*

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\* That out-and-out Automatism is the final verdict of a consistent interpretation, in accordance with our present mechanical science, has again and again been conceded by foremost scientific thinkers, from Descartes, Leibnitz, and Huygens to DuBois-Reymond, Helmholtz, and Wundt. Quite recently Haeckel, in *The Monist*, (Vol. II, No. 4, p. 484), does not hesitate to declare: "The so-called 'freedom of the will' is apparent only as each single volitional action is determined by a chain of precedent actions, which ultimately rest either upon *heredity* (propagation) or upon *adaptation* (nutrition). As these last are ('mechanically') reducible to molecular motions, the same holds true of the former."

More explicitly still: "The general science of nature assumes that in the whole world the same great, unitary, uninterrupted, and eternal course of development takes place, and that all natural phenomena without exception, from the motion of heavenly bodies and the fall of a rolling stone to the growth of plants and the consciousness of man, are governed by one and the same great Law of Causation;—and that all are ultimately reducible to atomic mechanics." (*Wissenschaft und freies Leben*.)

That even "the consciousness of man" is reducible to atomic mechanics, is more than most believers in the mechanical theory would admit. Haeckel, how-

If, on the other hand, we are—as we all *practically* believe—capable of directing our movements at will, and of thereby influencing the course of nature, then, most certainly, the mechanical theory is not a correct interpretation of the actual state of things.

There is no escape from this alternative. It has been the great standing dilemma ever since Gassendi revived the atomic theory and Descartes enunciated thereupon his dualistic world-conception: within us a mind filled with ideal phenomena; outside of us a realm of mechanically actuated matter; and no rationally conceivable interaction between the two.

Our own scientific thinkers are far, as yet, from having reached a sound monistic solution of this central problem. In fact, Du Bois-Reymond, with a full understanding of the import of mechanical necessity and a belief in its validity, has pronounced it insoluble. Professor Huxley, as a consistent *scientist*, is driven to admit that

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ever, does not take the consciousness of man to be altogether an outcome of mechanical motion. Indeed, in his view it is hard to discover any connexion whatever between consciousness and atomic mechanics. For he endows the mechanically moved atoms or molecules with mental qualities. And this involves among other incongruities an utmost Dualism in nature. In fact, the same irreconcilable Dualism that has confronted thinkers since Descartes's time: Two parallel-running worlds, the one material, the other mental, and no possible efficient interaction between the two.

To call this thoroughly dualistic conception, nevertheless, "Monism," simply because no supernatural agencies are invoked, is surely to mistake its essential philosophical character. When Haeckel, moreover, declares that he regards all matter not merely as "besouled, that is to say, endowed with feeling," but endowed also "with motion, or, better, with the power of motion," he fundamentally upsets the entire mechanical world-conception he professes to uphold. For it is of the essence of the mechanical view that all motion be imparted from outside to inert matter. As Leibnitz already knew: in the mechanical order "*un corps n'est jamais mû naturellement que par un autre corps qui le presse en le touchant.*" Anything endowed with intrinsic power of motion would antagonise the mechanical order by introducing into it an incalculable, newly and spontaneously arising amount of energy.

Besides, by identifying "mind" with "force," by taking mind, as well as motion, to be a force-emanation, Haeckel's *Principles of a Consistent Unitary World-View* lead to further confusion. Mental states, as such, are utterly forceless, wholly devoid of mechanical momentum, and cannot, therefore, be a manifestation of force. They do not enter into the concatenation of mechanical activities. They are incapable of moving matter. They have no place in the mechanical theory.

These remarks are advanced to show what profound inconsistencies have yet to be cleared away in order to arrive at a "consistent unitary world-view."

the conscious-automaton-theory is indeed the necessary outcome of the mechanical view. As a *philosopher*, however, he resolutely shakes off the mechanical shackles and alights by means of a miraculous *salto mortale* a full-fledged Idealist into the opposite domain of inwardness. And Mr. Spencer, with his wonted many-sidedness, essays in vain sundry contradictory modes of overcoming this same dilemma.\*

We desire to find explained, how in a world in which all change of position is held to be the strictly conditioned outcome of previously disposed and externally acting forces;—how in such a world it is possible for us to direct our movements by dint of intrinsically originated volition, becoming thereby enabled purposively to influence the otherwise rigorously necessitated course of a nature not forming part of our own being.

In the presence of the multifarious results of our nature-influencing capacity, it is nothing short of scientific fanaticism to profess disbelief in this power of ours over nature. For the sake of

\* If Mr. Spencer's reasoning were throughout logically consistent, instead of eclectically latitudinarian, it would compel him, as well as Professor Huxley, to accept without compromise the mechanical view. The material universe with its "physical modes of force" preceded in the course of evolution its mental realisation. Mr. Spencer admits that the mechanical interpretation is the correct interpretation of physical phenomena. And with an adequate understanding of its implications he further admits that matter itself is inert, and that its ultimate units are devoid of any qualitative distinctions. All qualitative distinctions in nature must, consequently, be due to mere difference of arrangement. Mr. Spencer himself asserts: "The properties of the different elements result from differences of arrangement, arising by the composition and recombination of ultimate homogeneous units." This is, as Mr. Fiske emphatically corroborates, the Spencerian view of material phenomena, when these many-sided savants are speaking from the side of the physicist. And it is undoubtedly the mechanically correct view.

Wundt, in his *Theory of Matter*, emphasises likewise the same well-founded mechanical principles. He says: "The entire development of physical atomism points to the derivation of all qualitative properties of matter from the forms of motion assumed by the atoms. The atoms themselves are thus necessarily completely devoid of quality."

Inert, absolutely rigid, qualitatively and quantitatively undistinguishable elements, driven into sundry changeful arrangements by externally impelled modes of motion; this, and no other, is the veritable mechanical world-material. And thinkers who accept the mechanical theory are logically debarred from the device of endowing their atoms with any sort of qualitative property, or with any in-dwelling "power of motion."

intellectual integrity it will be well to keep this most essential philosophical problem clearly in sight until rationally solved.

The thought of the eighteenth century—swayed partly by mechanical materialism, partly by the sensation-philosophy, or in Germany by the Leibnitz-Wolffian compromise—was in all its phases essentially fatalistic, making of man an utterly powerless vehicle or plaything of strictly predetermined conditions.

Those among us, whose philosophising is running riot in the sphere of unimpeded idealistic licence, or who amid an overwhelming flood of contradictory philosophical opinions have lost the moral hold on logical consistency, can hardly imagine how helplessly fettered human consciousness felt by those rigid automatic theories of existence. Under such paralysing influences the transcendental idealism of Kant, however soberly guarded it may now appear to us, was hailed as an awakening from a profound lethargic slumber, as a joyous deliverance from the mechanical and dogmatic incubus that had so long oppressed human self-confidence.\*

Kant convincingly taught that we are not merely perceptive mirrors, passively reflecting the marvels of an outside nature. But that, by dint of formative and constructive powers inherent in our own being, we ourselves fashion out of incoherent, sense-given data the entire world we are conscious of. And he taught, moreover, that, however much we may bodily and mentally be involved in the purely mechanical course of nature, our innermost being possesses, notwithstanding, the power of freely bending this otherwise rigorously necessitated course in conformity with the dictates of our moral ideal.

Ethical freedom, manifesting itself in intrinsic spontaneity of action—held however to be derived from a supernatural source—is what constitutes the central principle of the Kantian philosophy.

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\* This is what, among many other kindred expressions from contemporaries, the celebrated physician and philosopher Erhard has to say about the impression made upon him at the time by Kant's teaching: "Reading his works I shed tears of utmost joy. They made me realise myself as a rational being. I am who I am. No other person keeps control of my duties, or can do my thinking for me. The world I perceive is the problem for my knowledge; my inner feeling of freedom alone the judge of my worth. And this I owe to thee, my master, my spiritual father."



And it is the principle that has mainly inspired the speculative systems which since that time have followed one another in such profuse succession.

It is this same nature-transcending principle of intellectual and ethical spontaneity, admitting on its inward side to close communion with a supreme Intelligence, and on its outward side empowering human beings rationally to transform the sense-apparent world ;—it is this same principle of spiritual freedom that with its thought-woven mirage is delusively alluring to the desert wastes of pure Idealism our numerous Neo-Kantians and Neo-Hegelians, our Transcendentalists and Theosophists.

It may be now fully admitted, without fear of serious contradiction, that whatever we are conscious of must, as such, necessarily be wholly a product of powers inherent in ourselves, and can by no means be a passively mirrored image of something existing outside of us.

Percepts arise in us in a compulsory manner. We generally attribute their origin to the things or objects we perceive as existing outside of us. But it is clear that the things or objects we are thus actually perceiving are products of our own perceptive faculty, are indeed the percepts themselves, and, as such, constituents of our own consciousness. Such percepts can therefore not possibly be—as generally believed—products, effects, or copies of the things or objects perceived ; for they are themselves these very things or objects perceived.

The entire wealth of our conscious world is wealth inherent in ourselves, constituting thus—as may be in a certain sense admitted—a gradually accruing self-revelation of that inmost nature of ours, which abides beyond the play of conscious states.

We have no immediate knowledge of this innermost being. That which we are immediately cognisant of is the product of its activity, the outcome of its shaping faculty, a becoming conscious of so much of its present manifestations.

In this light, all things or objects dissolve into fluent products of unremitting activity. And if the things or objects we thus perceive are—as maintained by Idealism—the real things or objects of

this world, then things or objects have no substantial, self-contained existence, but are altogether rainbow-like phenomena, produced and sustained from moment to moment.

It is incontestable that we are immediately conscious of nothing but a succession of most complex, ever-changing, ever-dwindling mental states, arising from the depths of our hidden nature. Or, if pure phenomenism deems it an as yet unwarranted assumption to assert that the conscious phantasmagoria arises from our own hidden nature, we are left with nothing for philosophical contemplation but the conscious content itself, or that which is directly revealed as conscious phenomenon.

The correct analysis, the rational interpretation of this conscious content will yield the true world-conception. All divergence of philosophical opinion is due to divergence in the interpretation of this single fact of world-awareness, of that, namely, which is consciously present. Into conscious presence is re-collected all past experience, is re-membered the totality of world-realisation.

The ever-changing conscious content reveals itself as the product of some kind of activity. And as, on account of its evanescent, ever-renewed existence, it cannot be conceived as self-actuated and self-created, it has to be conceived as an outcome of the activity of some agency not forming part of its own transient states.

Kant assumed that the producing agent of the conscious display is intelligence. And it is this purely idealistic position that has been so vigorously defended by Fichte and Hegel, and by their followers to the present day. According to this view, intelligence, and intelligence alone, is the creator of all world-phenomena, such phenomena having their existence solely in the conscious activity of this intelligence.

Kant, it is true, had taken for granted the existence of a world of things-in-themselves, affecting our sensibility, and filling it with the material made use of by intelligence in its world-construction. But it is clear that nothing can possibly enter the conscious content from an outer world. Its sensorial and perceptual, as well as its conceptual phenomena, are all in all constructed by whatever produces and sustains it from within. Therefore, if intelligence is

really the producer and sustainer, then intelligence is the only efficient power in world-construction, and the assumption of a realm of things-in-themselves is wholly gratuitous.

From the idealistic standpoint it is a mere delusion to believe that our senses are affected by anything existing outside the conscious content ; for in verity there is no outside to it. All that consciously takes place in the world has its being in one and the same conscious content. This statement, when its meaning is fully realised, is indeed self-evident, admitting of no appeal.

But here the contrast involved in the idealistic view and in that of common sense, as seemingly revealed by perception, becomes strikingly apparent. Our individual being is generally held to be contained in what we call our body. And, moreover, it appears pretty evident that our entire consciousness is in some way an outcome of the activity of that particular part of the body we call our brain.

Now, when our body is consciously realised it often forms only a circumscribed and minute part of the entire world then consciously present. For instance, I at present perceive my body as a minute object within a vast landscape, consisting of a multiplicity of objects, and among them beings like myself. If the idealistic view is correct, if the percepts themselves are the real existents of this world, then our body—usually believed to be the bearer of the entire conscious content—forms, in fact, only an insignificant part of it. Consequently, instead of the conscious content originating within us individually, we, on the contrary, originate body and mind within the conscious content ;—indeed, originate therein only as a comparatively insignificant part of it. It would follow therefrom that the conscious world we realise is the product of powers not forming part of ourselves. For our body, being only a circumscribed phenomenon among many others in the conscious content, this all-containing conscious content cannot possibly be a product of this or any other part of itself.

For the same reason, the conscious content, idealistically conceived, can neither be individual self-realisation, as Fichte had maintained, nor can it be an auto-cosmos, as the hylo-idealists will

have it. In fact, no sort of Solipsism is admissible under the idealistic assertion, that the conscious content is self-significant reality. The legitimate outcome of the idealistic position is objective Phenomenism.

The idealistic view in one form or another has got such firm hold on many of our foremost thinkers that it is by no means a waste of words to point out its unavoidable implications.

The conscious content, of which we ourselves bodily and mentally, together with all other things of this world, are integrant parts, arises as a fluent phenomenon interruptedly and in fragments. It emanates as an ever-renewed, transient creation from a hidden matrix. This evident fact has led eminent thinkers, like Plotinûs, Boehme, Spinoza, Schelling, and others, to declare that the source of existence is in its inmost nature unconscious.\*

The phenomena of consciousness arise from a matrix not itself revealed in the conscious content among its constituent parts or states. Kant's "intelligible ego," which, as he maintains, never becomes an object either for the inner or for the outer sense, is an acknowledgment on his part of the existence of such an unconscious, or rather imperceivable, matrix. "Intelligence" or "Reason" are clearly only generic names given to the *conscious activity* of this hidden matrix. But such activity is not itself the matrix, as our Neo-Kantians and Neo-Hegelians are anxious to establish, in order—as Professor Caird asserts—to assimilate "man as spiritual with an absolute spirit."

Philosophy has thrown as yet no genuine, steadfast light on this obscure problem. Thus far we cannot say that the analysis of the conscious content has revealed the nature of the matrix whence it emanates. For it emanates just as little from any peculiar grouping of mechanically driven material particles, as from a purely spiritual activity.

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\* "The eternally Unconscious—that which constitutes the eternal sun in the realm of spirits is hidden by its own exceeding light; and though it never itself becomes an object, yet impresses its identity on all free actions;—this eternally Unconscious is at the same time the same for all Intelligences, the invisible root of which all Intelligences are mere factors." *Schelling (Werke, Ab. I, B. 3, S. 600).*

Let us, then, once more attempt to discover given data, that may help us to more positive conclusions concerning this inmost nature of our being. Such critical examination may perhaps at the same time enable us to overcome to some extent the central dilemma of matter and spirit, of automatism and spontaneity, of mechanical necessity and non-mechanical or so-called free causation.

No thinker, save an absolute Solipsist, will deny the existence of beings like himself. We have, however, seen why the solipsistic standpoint is logically untenable. There is, therefore, logically nothing to debar us from admitting the existence of beings like ourselves. We ask, then, how do we, and the Idealist among us, get to realise such existence? The latter cannot rightly maintain that he realises, for instance, the existence of his friend, as a purely ideal existence. He has absolutely no direct knowledge of the ideal nature of his friend. He is not in the least directly cognisant of his friend's sensations, thoughts, emotions, and volitions. These form in no way part of his own conscious content. What he is directly cognisant of, is the percept he calls the body of his friend. And it is solely by dint of perceptual or bodily signs that he indirectly infers that his friend is also a conscious being like himself.

It is undeniable, then, that his friend's ideal nature has no power whatever to affect the Idealist's perceptibility, so as to make itself directly known to him. It is incontestable, on the other hand, that his friend's non-ideal, non-conscious self has power to affect his perceptibility in most specific and distinct ways, so as to become directly known to him as the group of definite percepts he calls his friend's body.

Let us keep clearly in mind that nothing mental has power to affect the perceptibility of beholders, and that what is called our body is only a group of percepts in the conscious content of such beholders. It follows that our veritable self, the hidden matrix whence our consciousness arises, is of a nature altogether differing from anything manifest as mental or material. It cannot be like any of the mental phenomena casually found in our conscious content, not even like reasoning, or willing, or any activity we are directly conscious of. Neither can it be like the group of percepts

arising in the consciousness of him who perceives us, and which we call our body. It is consequently neither of the nature of mind nor of that of body.

It is, however, unmistakably, an existent that has power to arouse distinct perceptual realisations of itself in the consciousness of beholders. And it is an existent that is also the bearer of its own conscious content. It therefore has a nature incommensurably transcending in efficiency and import the group of percepts we call our body, as well as the group of other conscious states we more particularly call our mind.

Should the interpretation here given, despite its denial of the substantial existence of matter as a *perceived* entity, be nevertheless decried as "materialistic," there will be no objection raised to the use of this much-maligned term. The view here advocated is, indeed, essentially materialistic. Only matter must then be defined as that which affects our sensibility, awakening thereby definite percepts in our conscious content. And the usual mistake of looking upon the awakened percepts themselves as material objects must be avoided. For these are mere transient symbolical representations of the actual power-emanating existents. As such they form marvellously distinct and specific, yet wholly inadequate mental pictures. Looking at a brain, for example, how can the transient percept momentarily awakened in our consciousness, and consisting of nothing but differently colored surfaces, how can such a mere symbolical picture adequately represent the real existent, which science proves to have been most toilsomely elaborated during untold ages, and which contains all the gathered results of such elaboration?

And, as regards the functional activity of this highest achievement of material elaboration, how can its true import be at all realised merely by means of molecular agitation perceptible within its mental image? We know, however, that this same activity, which manifests itself to an outside observer as mere molecular agitation within his own percept, means incommensurably more to him whose brain is thus functionally active. Through such functional activity his world-revealing conscious content emanates from the inscrutable depths of his all-comprising being.

This being, though not itself of the nature of mental or conscious states, has such states as a functional outcome of some of its specific activities ; and though not itself of the nature of *perceived* matter, has power to awaken material percepts by affecting in specific ways the sensibility of beholders.

The realistic implications involved in this unmistakable state of things are almost universally shunned and dreaded. But are not the true facts of existence more profoundly marvellous than any fanciful conception of ours?

Our transient and forceless conscious content being but a functional outcome of the activity—not of what is perceptually known as our body and its brain—but of that hidden self of ours which awakens these definite percepts in beholders ; it follows that this hidden self is more fundamental, permanent and essential than any of its own mental states, or any set of percepts it may awaken in beholders.

In the light of what has been stated, it will not be difficult to realise, that, when I move my arm I cannot rightly say that the mental state I am conscious of as my volition has moved my arm. Nor can I say that the percept in him who witnesses the performance, and which he calls my body, has moved my arm. Both these modes of realisation : my own inner consciousness of the act, and the beholder's outer consciousness of it, are but mental symbols of the activity of my veritable being, my being which steadfastly abides beyond all conscious realisation.

Having thus but a symbolically inferential knowledge of activity, and but a symbolically inferential knowledge of that which is active, it is no wonder that the actuation of volitional movements, and, analogically, that of all other motion in nature, is so strangely enigmatical.

That much, however, may be clearly ascertained ; namely, that no kind of activity is purely mechanical. What Newton called *vis insita* in contradistinction to *vis impressa* plays a part of its own, indeed by far the most important part in nature.

The peculiar modes of reaction, of active resistance or intrinsic response, opposed by different kinds of matter to external impul-

sions, evinces the existence of specific indwelling powers. And it is these powers that underlie the perceptually realised qualitative properties of material compounds.

A wonderful amount of mathematical and physical ingenuity has been vainly expended by eminent scientists in order to bring reactive modes of motion under strictly mechanical laws. Elasticity, cohesion, chemical activity and union, gravitation, magnetic phenomena, muscular contraction, one and all have been tortured upon the mechanical rack without yielding the secret of their specific modes of activity.

To choose an extreme example of non-mechanical actuation, who can soberly contend, (though there have been mechanical enthusiasts that have gone even that far,) that the development of the chick in the egg is caused by the heat-motion imparted to it from outside. Is not the rigorously preconcerted rearrangement of the constituting material, which results in the formation of the chick, governed by most specific affinities inwoven in the reproductive germ?

During vital activity material elements are forced by compelling influences, emanating from the functioning substance itself, to fall into definite molecular arrangements. They are not forced to fall into such arrangements by dint of motion imparted from without. The functional agitation of the living substance is therefore not of the mechanical order.

In closely observing the functional activity of living substance it becomes visibly and unmistakably manifest that such activity is not of the mechanical order. It is not caused by the transfer of energy through mechanical impact. The constituent elements of the functioning substance are not driven together or asunder by externally imparted impulsion. What takes place on stimulation is, first, a chemical rupture, a so-called explosion, under which a definite organic molecule is severed from the original chemical totality of the substance acted upon. In consequence of this encroachment from outside a reaction sets in, spreading over a more or less extensive portion of the living substance, and resulting in a complete reintegration of its disrupted chemical totality. The living



substance restores its integrity by force of those most specific chemical affinities through which it is itself constituted. These enable it to fill the chemical or functional gap with complemental material assimilated from outside.\*

The peculiar chemical or molecular constitution of the living substance is that which distinguishes it from other substances. And it is only through strict maintenance of this most definitely specific constitution that one kind of living substance is distinguished from another. Their reproductive germs, though microscopical and apparently all but homogeneous, contain evidently already with utmost faithfulness the distinguishing molecular traits.

Science has conclusively proved, that such marvellously specific and high-wrought chemical or molecular constitution is the result of endless elaboration. How then can the functional agitation of the living substance which aims at specific reintegration upon outside encroachment be of a mechanical nature? How can we feel justified in looking upon a molecular agitation which is directed with most punctilious selection by specifically ingrained chemical affinities as belonging to the mechanical order? Because we have experience of mechanical modes of motion, or rather because by excluding from consideration the specific constitution of bodies, and taking into account only their masses, we can reduce the motions imparted to them from outside to mechanical laws, it is vaguely hoped that these

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\* For calling this vital reaction and more especially that occurring during functional activity in the brain of higher organisms "hyper-mechanical," as I have done on former occasions, I have been censured by the Editor. This occurred probably under the impression that I meant by "hyper-mechanical" some super-natural agency here at work, while I only meant specific modes of motion originating from within, and transcending in efficiency any possible kind of mechanical display. The Editor himself is inclined to believe in activity originated from within. Such activity he will surely not call "mechanical." For it is of the essence of mechanical activity, that the acting substance as such be inert, and that all activity be imparted to it *ab extra*.

The arguments in this discussion do not apply to physicists who employ a working-hypothesis other than the mechanical. Such, for instance, as attribute to the material elements whatever attracting or repelling energies their calculation requires. Or such as discard all realistic assumption of matter and force, and confine themselves simply to the perceptual phenomena of interdependent motions, or such again as adopt the vortex-hypothesis, or assume some kind or other of ether-condensation, etc., etc.

same laws may be analogically applied even to such molecular modes of motion as are due to those specific relations between the constituent elements of bodies that impart to them their distinguishing characteristics.

Under the mechanical aspect "evolution" can mean only what its name literally implies; namely, the necessary unfolding of what is already potentially pre-determined in the initial disposition of that which is being evolved. There is no room here for any accession of power, for any specific modes of energy, for any genuine epigenesis, for any creative play or spontaneity of action. Everything the absolutely fatalistic outcome of mechanically moved matter.

This mechanical view of things cancels inexorably the significance and efficiency we so fondly attribute to that inner life of ours which we find revealed as the most intimate manifestation of our being. Our thoughts, emotions, and volitions are then a mere useless, foreign by-play to the mechanical evolutions of insentient matter.

This is the sorry predicament in which mechanical science seeks to place our unitary being, this world-revealing self of ours, that constitutes in all reality the memorial and epitome of the ceaseless travail of time-evolved creation. To find a scientifically consistent way out of the entanglements of such a monstrously inadequate interpretation of natural occurrences should constitute the foremost endeavor of philosophical contemplation.

Our foundation has evidently to be laid deeper than either what is usually called materialism, or what is called idealism. For materialism of the atomic and mechanical kind fails to establish any legitimate interaction between bodily activities and the corresponding mental states. And it moreover fails to leave a way open for the endowment of sense-affecting existents with intrinsic properties and forces, such as give rise to the specific qualities and spontaneous activities we perceive. Idealism of the genuine kind, on the other hand, is erected on an essentially erroneous pre-supposition, on the postulate, namely, that mind as such can affect mind, or rather that the mental states of one being can enter into direct intercommunication with the mental states of another being. And it further fails

to afford any sort of explanation for the sense-derived percepts by which that other being is consciously realised ; realised thereby solely as a bodily and not as a mental or ideal existent.

In the course of this discussion it has been shown that the perceptual realisation of matter in motion does only symbolically and remotely disclose the nature of that which is seen to move, hiding from view the veritable source of the activity thus perceived as motion. There has been found ample reason to conclude that the activity displayed by living beings, and symbolically perceived as their bodily movements, is a functional activity emanating from the non-mental nature of those beings ; from that nature of theirs namely, which has power to arouse representative percepts in beholders. And ample reason has further been found to justify the conclusion, that the molecular motion visible during such activity in the mental image or perceptual realisation is of a nature altogether transcending any possible kind of mechanical motion.

Analogically we may rightly conclude, that all existents that have power to awaken representative percepts in beholders, and this means all perceptible things of this world, are likewise potentially endowed with specific modes of activity, of which the phenomena of elasticity, cohesion, chemical selection and union, and so on, are manifest displays.

Nay, the very power of arousing definite percepts in beholders is itself the most striking proof of specific, never-flagging activity on the part of the perceived existents ; an activity which constitutes their very nature, and on account of which these sense-stimulating existents may well be called specific power-complexes.

The incalculable factor of newly arising modes of specific activity, which gives to "evolution" its true significance, is evidently introduced into nature by a more or less incidentally occurring combination of material elements. These combinations acquire thereby as newly formed compounds also newly arising specific properties of their own. And this means that they react in new and specific ways on being influenced or acted upon by surrounding existents.

Reaction by dint of specific, indwelling efficiency plays, as already stated, a far more important part in nature, than causation

understood as an external producer of effects. Material compounds, as they become more and more highly elaborated, oppose more and more specific modes of reaction to outside influences. And when in the living substance specific modes of reaction have become functionally attuned to specific modes of stimulation, then that significant play of interaction between organism and environment supervenes, which gives us rightly the impression of being purposive or teleological.

Considering what ceaseless vital toil, what slowly moulding interaction with a specific environment, carried on unremittingly during untold ages, was actually required to elaborate higher forms of conscious beings ; how can we well conceive the consciousness of these beings, thus gradually evolved, and obviously only the outcome of functional activity ; how can we feel justified in conceiving it as a separate and finally independent entity ?

The activity of our being which gives rise to the emergence of an idea, say the idea of some definite movement to be executed, would in an outside observer awaken the perception of an infinitesimal molecular stir originated in some minute cerebral structure. And this molecular stir would be seen by the observer to spread along definite nerve-tracts until it reached the motor organs innervated by them. Here a voluminous molecular agitation would be incited, accompanied by contraction of the entire muscular substance. This motor function would by the outside observer be perceived as purposive movement, while it was being felt by the performer himself as voluntary activity.

The same activity incited, not by the performer's own initiative, but by some external influence, would not be felt as voluntary, but merely realised as automatic. This kind of automatism would be, however, by no means of a mechanical, but strictly of an organic, nature. It would be produced by intrinsic and specific modes of activity.

The difference between voluntary and automatic activity of the organic kind can be distinctly realised by watching, for example, our breathing movements. These are generally carried on automatically and unconsciously. By directing our attention to them

we, however, become conscious of the automatic activity. This is a genuine instance of conscious automatism ; for there is no effective intercommunication between the movements and the awareness of them. The activity that underlies the conscious state, and the activity that underlies the perceived movements, are only concomitant and not interdependent. But we are, moreover, able to assume voluntary control of the movements. We can, at will, breathe quicker or slower, deeper or less deep, or entirely inhibit the movements for a time. The consciousness of this voluntary performance compared with the consciousness of the mere automatic action will clearly indicate the difference between spontaneous and automatic activity. Here the two activities have entered into effective intercommunication. The activity that underlies the movements has become dependent on the activity that underlies the conscious volition.

The complete volitional control we have over the movements of those muscular apparatuses that minister to our life of outside relations constitutes in the executive department of our being that freedom of activity, which enables us to transform the given opportunities of nature in compliance with our ideal purposes.

We may, then, finally and legitimately conjecture, that an existent, which under functional excitation becomes conscious, though it cannot itself be of the nature of any of its conscious states, must nevertheless as their all-containing potential matrix be considered as mentally endowed ; must, in fact, be the bearer of the organ of mental awareness. And we may further legitimately conjecture that, what by means of inadequate symbolical representation is revealed to perception as our bodily organisation, is in all reality the existent that under functional excitation of its central organs becomes conscious.

The activity felt by us as voluntary is in verity the outcome of a spontaneous exertion on the part of our symbolically revealed, but otherwise hidden being. We hold spontaneous sway over the movements of the organs that minister to our life of outside relations. We control the use of our limbs, moving at will and manipulating with purpose the existents of the outside world. We voluntarily

incite or inhibit the movements of our sensory organs, thereby foreseeing the revelations or attesting the validity of our tactile impressions. And we intentionally innervate the movements of our vocal organs, communicating thus to our fellow-beings the experience these same articulated movements have enabled us to rationalise.

It is by force of such motive control that we are free and not automatic agents.\*

EDMUND MONTGOMERY.

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\*After having for years in my deficient way urged the task of scientifically overcoming the mechanical or necessitarian theory, in order to arrive at a monistic conception of our own nature and the world at large, it is highly gratifying to find that so eminent a scientific thinker as Professor Peirce has, on entirely different and far more precise grounds, reached the same all-important conclusion.